Alg. 2 Warm Up # 8-1

Solve:

1. $2^{3x} = \left(\frac{1}{16}\right)^{3x - 5}$

2. $2 \log_7 3 = \log_7(x+1) + \log_7(x-1)$

3. Solve by completing the square.

   $x^2 + 6x - 11 = 0$

Quiz #6 - Friday

* Solve an equation with radicals.
* Solve a quadratic by factoring.
* Solve a quadratic by completing the square.

Practice:

$3 = \sqrt{x} + \sqrt{x-3}$

$(3-\sqrt{x})^2 = (\sqrt{x-3})^2$

$(3-\sqrt{x})(3-\sqrt{x}) = x-3$

$9 - 3\sqrt{x} - 3\sqrt{x} + x = x - 3$

$-x \quad -x$

$-6\sqrt{x} = -12$

$-6 \quad -6$

$(\sqrt{x})^2 = (2)^2$

$x = 4$

Check

$3 \stackrel{?}{=} \sqrt{4} + \sqrt{4-3}$

$= 2 + 1$

$3 = 3$ ✓

HW Questions:

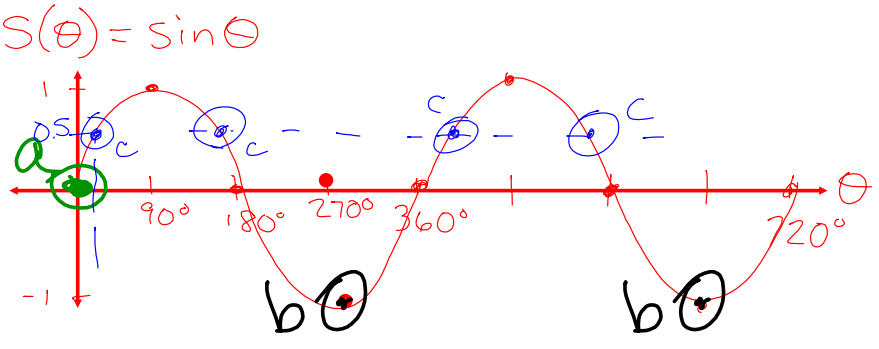
Review & Preview

7-36. Sketch a graph of the first two cycles of $s(\theta) = \sin\theta$. Then label your graph to show the following positions of a passenger on *The Screamer*.

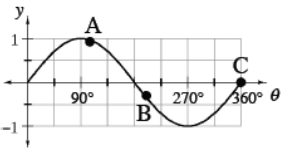
a. The passenger gets on initially.

b. The passenger reaches the bottom of the water pit.

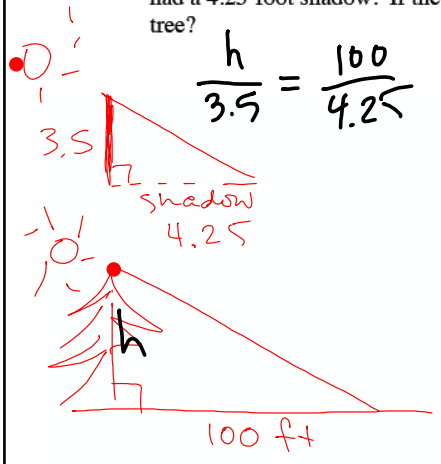
c. The passenger is halfway between the highest point of *The Screamer* and the ground level.



7-37. Each of the points on the graph at right represents the position of a rider on *The Screamer*. Draw a diagram of each rider's position on a unit circle and describe where the rider is located.

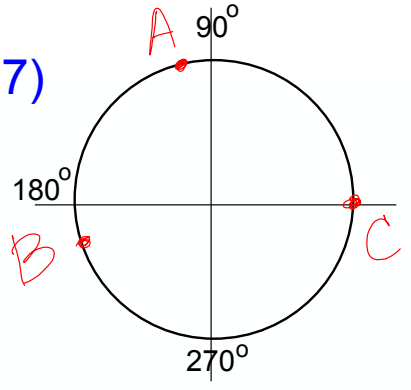


7-38. While trying to measure the height of a tree, Julie noticed that a 3.5-foot post had a 4.25-foot shadow. If the tree's shadow is 100 feet long, how tall is the tree?



$\frac{h}{3.5} = \frac{100}{4.25}$

37)



7-39. Given that $\log 2 \approx 0.3010$, $\log 3 \approx 0.4771$ and $\log 5 \approx 0.6990$, calculate each of the following logarithms without using a calculator.

a. $\log 6$ b. $\log 15$ c. $\log 9$ d. $\log 50$

7-40. Find the x- and y-intercepts of the quadratic function $y = 3x^2 + 6x + 1$.

7-41. Write the quadratic function in problem 7-40 in graphing form and sketch its graph.

$\log(2 \cdot 3)$

$\log 2 + \log 3$

$\log(2 \cdot 5^2)$

$\log 2 + \log 5^2$

$\log 2 + 2\log 5$

for #40 Solve by ① zero prod. property
② complete the square
③ Quadr. Formula

$y = a(x-h)^2 + k$

#41 → $y = 3(x^2 + 2x + 1) + 1 - 3$

$y = 3(x+1)^2 - 2$

#40 x-int: $0 = 3(x+1)^2 - 2$

$\frac{2}{3} = (x+1)^2$

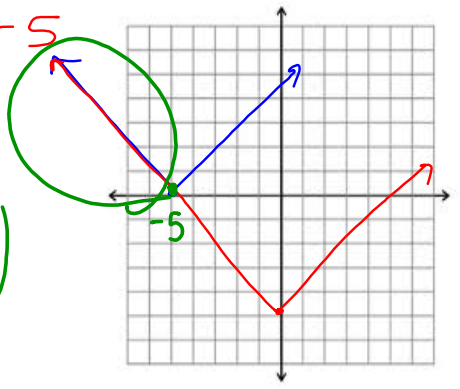
$\pm\sqrt{\frac{2}{3}} = x+1$

$\left(-1+\sqrt{\frac{2}{3}}, 0\right)$

$\left(-1-\sqrt{\frac{2}{3}}, 0\right)$

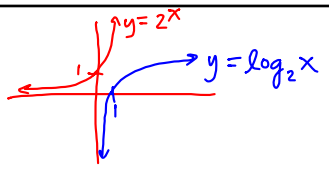
7-42. Solve $|x+5| = |x| - 5$ by graphing. Express your solution algebraically.

$y = |x+5|$ $y = |x| - 5$



$x \leq -5$

$y = \log_2 x \rightarrow y = 2^x$



7-43. Solve $\log_2 x = 2^x$ using any method.

No Solution●

7-44. Maria Elena is collecting college pennants. She has five fewer pennants from Washington campuses than from California campuses and twice as many pennants from California campuses as from Pennsylvania campuses. She has 40 pennants in her collection. Write a system of equations to find the number of Pennants from each state.

$w + c + p = 40$

Let w = # of pennants from Washington
Let c = # from California
Let p = # from Penn.

$w = c - 5$ ← $w + 5 = c$

$p = \frac{c}{2}$ ← $2p = c$

$c - 5 + c + \frac{c}{2} = 40$

$2\left(2c + \frac{c}{2}\right) = (45)2$

$4c + c = 90$

CP's: 7- # 45 ---> 49

p. 327

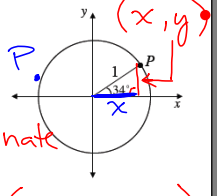
7.1.4 How can I graph cosine?

Graphing and Interpreting the Cosine Function

In this lesson, you will use your knowledge of right triangles again – this time to develop your understanding of another cyclic function.

SOH CAH

7-45. Work with your team to find the coordinates of point P on the unit circle shown at right. Is there more than one way to find point P? Be prepared to share your strategies with the class.



(x, y)

P

height of △ = y coordinate

$\sin 34° = y$

$y \approx 0.56$

$P(\approx 0.83, \approx 0.56)$

$P(\cos 34°, \sin 34°)$

base of △ = x coordinate

Use pythagorean Th or cosine 34°

$x^2 + (\sin 34°)^2 = 1^2$

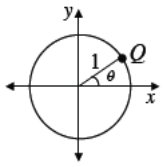
$\sqrt{x^2} = \sqrt{1 - (\sin 34)^2}$

$x = \sqrt{1 - (\sin 34)^2}$

$x \approx$

$x = \cos 34°$

$x \approx 0.83$

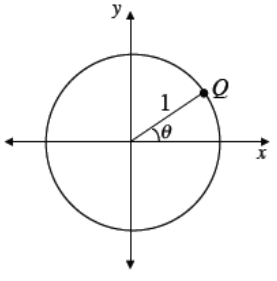
7-46. 

Now generalize what you found in problem 7-45 to write the coordinates of point Q on the unit circle shown at left.

7-47. What can a sine value tell you about a point on a circle? What about a cosine value?

7-48. If you know the sine of an angle in a unit circle, can you find its cosine? How? Work with your team to find a strategy and be prepared to share it with the class.

7-49. An angle θ on the unit circle has a cosine of $\frac{3}{4}$.



a. Find the exact coordinates of point Q by using the Pythagorean Theorem.

b. What is the value of $\sin\theta$?

c. Using what you determined in problems 7-47 and 7-48, how could you rewrite the Pythagorean Theorem using trigonometric functions for the lengths of the sides? When written like this, the Pythagorean Theorem is called the **Pythagorean Identity**.

HW: 7-

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